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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/496,068	02/01/2000	Anil M. Murching	PU020211	5671

7590   02/28/2003

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EXAMINER
LAROSE, COLIN M

ART UNIT	PAPER NUMBER
2623	

DATE MAILED: 02/28/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE _3_ MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☐ Responsive to communication(s) filed on _____ .

2a) ☐ This action is **FINAL**.   2b) ☒ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) _1-6_ is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5) ☐ Claim(s) _____ is/are allowed.

6) ☒ Claim(s) _1-5_ is/are rejected.

7) ☒ Claim(s) _6_ is/are objected to.

8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) ☐ The specification is objected to by the Examiner.

10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.

    If approved, corrected drawings are required in reply to this Office action.

12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a) ☐ All b) ☐ Some * c) ☐ None of:

      1. ☐ Certified copies of the priority documents have been received.

      2. ☐ Certified copies of the priority documents have been received in Application No. _____ .

      3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

14) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

    a) ☐ The translation of the foreign language provisional application has been received.

15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .

4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Drawings

1.   This application has been filed with informal drawings which are acceptable for

examination purposes only. Formal drawings will be required when the application is allowed.

Claim Rejections - 35 USC § 102

2.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the

basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3.   Claim 1 is rejected under 35 U.S.C. 102(b) as being anticipated by "Automatic

Watershed Segmentation of Randomly Textured Images" by Shafarenko et al. ("Shafarenko").

Regarding claim 1, Shafarenko discloses a method of extracting regions of homogeneous

color in a digital picture comprising:

dividing the digital picture into blocks (Shafarenko operates on pixels, which are the

smallest image blocks); and

merging together spatially adjacent blocks that have similar color properties to extract the

regions of homogeneous color (Abstract: watershed routine is used to merge pixels according to

color contrast). .

Claim Rejections - 35 USC § 103

4.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in
> section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are
> such that the subject matter as a whole would have been obvious at the time the invention was made to a person
> having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the
> manner in which the invention was made.

5.   This application currently names joint inventors. In considering patentability of the

claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various

claims was commonly owned at the time any inventions covered therein were made absent any

evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out

the inventor and invention dates of each claim that was not commonly owned at the time a later

invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c)

and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6.   Claims 2-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shafarenko in

view of "Unsupervised Video Segmentation Based on Watersheds and Temporal Tracking" by

Wang.

Regarding claim 2, Shafarenko discloses the merging step comprises:

extracting a feature vector for each block (Shafarenko processes pixels in LUV color

space; the L, U, and V values for each pixel comprise a feature vector);

estimate a scalar gradient value for each block as a function of the feature vector, the set

of gradient values defining a color gradient field (Section B, paragraph 2, page 1533: each pixel

is assigned an LUV gradient value according to the maximum Euclidean distance to the furthest

neighbor; the set of all gradient values produces a field);

segmenting the gradient field with a watershed algorithm that divides the gradient field

into a set of spatially connected regions of homogeneous color (third paragraph, page 1531:

watershed algorithm uses LUV gradient to segment image by color).

Shafarenko is silent to digitizing the color gradient field. However, Shafarenko's method

is implemented on a computer, so any computed values are digital.

Shafarenko is silent to preprocessing the digitized color gradient field to produce a

smoothed color gradient field.

Wang discloses a similar segmentation routine, wherein image gradients are applied to a

watershed algorithm to segment an image into homogeneous regions. Wang teaches smoothing

the gradient field prior to utilizing it for the watershed algorithm. Wang dilates then erodes the

gradient image, thereby reducing local minima caused by noise or quantization error (Section A,

step 3, page 540).

It would have been obvious to one of ordinary skill in the art at the time of the invention

to modify Shafarenko by Wang in order to preprocess the color gradient field as claimed, since

Wang teaches smoothing the gradient field removes noise.

Regarding claim 3, Shafarenko discloses the extracting step comprises:

transforming the data in each block into a perceptually uniform color system (Section B,

page 1533: pixels are placed in perceptually uniform LUV color space);

calculate N moments of the data in each block for each color component, the set of

moments being the feature vector for the block (there is only one element in each block, so the

moment is simply the L, U, and V values of the pixel).

Regarding claim 4, Shafarenko discloses the estimating step comprises:

selecting the maximum of the distances between the feature vector of each block and the

neighboring vectors as the gradient value for the block (Section B, paragraph 2, page 1533: each

pixel is mapped onto the distance to its furthest neighbor).

Shafarenko does not expressly disclose obtaining distances between the feature vector of

each block and the feature vectors of each neighboring block. However, in order to find the

maximum distance, all of the distances must be known. Therefore, this step of obtaining is

implicit in Shafarenko's teaching.

Regarding claim 5, Shafarenko teaches applying a weighted Euclidean distance metric to

the feature vectors to determine the distances (Section B, paragraph 2, page 1533: Euclidean

distance is used to estimate the gradient; weighting is unity since there is only one moment for

each block).

Allowable Subject Matter

7.   Claim 6 is objected to as being dependent upon a rejected base claim, but would be

allowable if rewritten in independent form including all of the limitations of the base claim and

any intervening claims.

Regarding claim 6, Shafarenko is silent to converting the feature vector into a pmf-based

representation for each color component and then computing and selecting, as claimed.

Conclusion

Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Colin M. LaRose whose telephone number is (703) 306-3489.

The examiner can normally be reached Monday through Thursday from 8:00 to 5:30. The

examiner can also be reached on alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Amelia Au, can be reached on (703) 308-6604. The fax phone number for the

organization where this application or proceeding is assigned is (703) 872-9314.

Any inquiry of a general nature or relating to the status of this application or proceeding

should be directed to the TC 2600 Customer Service Office whose telephone number is (703)

306-0377.

AMELIA M. AU
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600

CML
Group Art Unit 2623
21 February 2003